

DISTRIBUTION OF PRECIPITATION IN NORTH GERMANY.<sup>1</sup>

By GUSTAV HELLMANN.

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The region considered is, roughly, that part of Germany lying north of latitude 50° N. Charts and data showing monthly and yearly averages based on 20 years' observations are published elsewhere, and the general results are discussed in this paper. Two tables are at present devoted to yearly averages, the one giving this information for individual provinces and the other showing the percentage area of each province which receives an annual rainfall between given limits. Posen is the driest (509 mm.), 42.4 per cent of the area receiving less than 500 mm., 57.1 per cent between 500 mm. and 600 mm., and 0.5 per cent between 600 mm. and 700 mm. The wettest is Westphalia (807 mm.), 50.4 per cent receiving between 700 mm. and 800 mm., while, quoting extremes, 1.1 per cent receives between 500 mm. and 600 mm., and 1.1 per cent between 1200 mm. and 1400 mm.

Monthly averages are expressed as percentages of the yearly sum, and three types of yearly distribution are recognized, according to the position of the maxima; (1) a single maximum in a particular month, (2) one or more secondary maxima, (3) a transition type in which a month adjacent to a maximum is almost as high itself. A map shows the distribution of these types, the salient features being that type (1) with a July maximum is by far the most extensive and that there is a general transition from a June maximum in the south to an October maximum in the north, September being passed over without showing as a maximum in any district. The driest month is March in East Prussia, February in the central regions and April in the west. The distribution of the amplitude, expressed as a percentage of the yearly sum, is illustrated by a map which shows a decrease from 12.5 per cent in the east to 3.5 per cent in the west, with a tendency for areas of maximum on the lee side of mountains. There is a rapid decrease with altitude in mountain districts.—*M. A. G.*

EARLY RECORDS OF TROPICAL HURRICANES ON THE TEXAS COAST IN THE VICINITY OF GALVESTON.<sup>2</sup>

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By REX D. FRAZIER.

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NOTE.—The following account of the hurricanes which visited the Texas coast in the vicinity of Galveston in early times is excerpted from a report rendered by Mr. Frazier to the Galveston-Houston Electric Railway Co. The record is here carried up to 1876, which is the date at which Dr. Oliver L. Fassig's record (*Weather Bureau Bulletin X. "Hurricanes of the West Indies"*) begins. While Mr. Frazier has only considered storms affecting Galveston and vicinity, Dr. Fassig has treated the subject with respect to the frequency, the tracks of the storms, and their annual distribution; hence the records are not comparable. However, aside from its historical interest, this record of early storms may have uses of a scientific character. Mr. Frazier's courtesy in submitting his entire report to the Weather Bureau is acknowledged.—EDITOR.

Tradition tells of great gales that have swept the Texas coast, inundating it to a great extent and uprooting trees, casting ships far inland, and changing coast lines. Historical reference is made to gales that wrecked the ships of the early explorers. Probably the first is in the narrative of Alver Nunez, a Spanish explorer, who, with 48 companions, the survivors of a party of 240, was cast ashore during a gale in November, 1527. They landed on an island called Malhado, which, according to historians, was in all probability Galveston Island. La Salle in his wanderings along the Texas coast searching for the mouth of the Mississippi river encountered severe gales.

According to the Spanish chroniclers, a severe gale on September 4, 1766, destroyed a mission on the shore of Galveston Bay and caused a high tide which inundated the land.

Several years ago the writer was told that the bleaching hulk of a wrecked vessel stood 40 miles inland on the prairie between Matagorda and Copano Bays. This vessel had been there within the memory of the earliest settlers. About eight or nine years ago the rotting hulk of an old vessel was uncovered at a point about 25 miles west of Houston. This find was at least 40 miles from the nearest salt water, but as it was only 4 miles from the channel of the Brazos River very likely it had been carried overland and buried during one of the periodical floods of that stream. The oldest resident in that vicinity did not know when the vessel had been wrecked, so

it evidently occurred in the early part of the past century or possibly earlier.

From the best authorities it is learned that up to the year 1816 Galveston Island was uninhabited, and it is probable that the only human beings regularly visiting the island were the Carankawa (also spelled "Carancahau") Indians. This was a tribe of stalwart savages, having the reputation of being cannibals, who hunted along the Texas coast and crossed to Galveston by a series of shoals about 15 miles west of the city. This string of shoals or reefs still bears their name.

In the narrative of Col. Warren D. C. Hall, printed in 1859, Galveston Island in 1816 is mentioned as Snake Island, or Isle de Calebras, as it was called by the Mexicans and Indians, and was not generally known, if at all, as Galveston. However, all the islands along the Texas coast were called Isles de Calebras in consequence of the number of rattlesnakes to be found in the driftwood and sand hills common to all of the islands next to the Gulf shore. According to Col. Hall, the island in 1816 was composed mainly of marsh, with an occasional ridge or elevation of 2 or 3 feet, and the whole surface, with the exception of the bays and bayous, was covered with a luxuriant growth of grass.

The main island was separated from a smaller one to the eastward by a pass from the Gulf 5 or 6 feet deep, and the eastern island was known as Little Campeachy. Col. Hall fails to mention that Galveston Island was called Campeachy, which is mentioned by different historians. According to an issue of the *Galveston News* under date of Tuesday, June 4, 1869, Don Luis Aury visited Galveston Island on May 10, 1817, and found the pirate Lafitte, driven from Baratania, in full possession of the island. Aury mentions that the island was called Campeachy.

At that time Pelican Island was merely a narrow piece of marsh on which it was impossible to walk dry-footed, except upon a small spot about 100 feet in length. The marsh, covered with sea grass growing in the mud, was covered with water at high tide and was not visible at any distance. Col. Hall mentions that by 1820 the island had increased to a kind of shell bank, the east side of

<sup>1</sup>*Preuss. Akad. Wiss.*, Berlin, 1919, 38: 980-990.<sup>2</sup>Cf. also Early Texas coast storms. *MO. WEATHER REV.*, Sept., 1919, 47: 641-642.